



EXPRESS MAIL CERTIFICATE

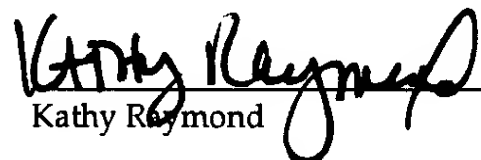
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I hereby certify that the *attached* correspondence comprising:

1). Declaration under 37 CFR §1.131 Declaration by Eddie E. Scott of Prior Invention by Robin R. Miles, Kerry A. Bettencourt, and Christopher K. Fuller to Overcome Cited Patent (5 pages) w/attachments (55 pages), 2). Return postcard is being deposited with the United States Postal Service as "Express Mail Post Office to addressee" under 37 CFR 1.10 on the date indicated below in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

July 13, 2003


Kathy Raymond

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|--------------|---|--------------|--------------------------------|
| Applicant : | Robin R. Miles, et al. | Docket No. : | IL-10632 |
| Serial No. : | 09/733,857 | Art Unit : | 1753 |
| Filed : | December 8, 2000 | Examiner : | Alexander Stephan Noguerola |
| For : | DIELECTROPHORETIC CONCENTRATION OF PARTICLES UNDER ELECTROKINETIC FLOW | | |

DECLARATION UNDER 37 CFR §1.131

Declaration by Eddie E. Scott of Prior Invention by Robin R. Miles,
Kerry A. Bettencourt, and Christopher K. Fuller to Overcome Cited Reference

Commissioner of Patents and Trademarks
Alexandria, VA 22313-1450

Dear Sir:

I, Eddie E. Scott, hereby declare that:

- (1) I am a citizen of the United States and a resident of Danville,
California;
- (2) My education includes: Bachelor of Science Degree, University of
Wyoming; Master of Science Degree, University of Texas at Dallas; Juris Doctor
Degree, University of Wyoming; Patent Office Academy, Basic and Advanced,
United States Patent and Trademark Office, Washington, D. C.;

(3) I am an active member of the State Bar of California, an inactive member of the State Bars of Texas and Wyoming, and I am registered to practice before the United States Patent and Trademark Office;

(4) I am employed by the University of California, at the Lawrence Livermore National Laboratory, Livermore, California, as Assistant Laboratory Counsel, having been employed by the University of California, at the Lawrence Livermore National Laboratory from May 1, 1999 to the present, and I am empowered to act on behalf of The Regents of the University of California, the owner of the subject application;

(5) I am the attorney representing the inventors Robin R. Miles, Kerry A. Bettencourt, and Christopher K. Fuller (The Inventors), in the subject patent application;

(6) In an Office Action mailed 05/08/2003 the Examiner rejected the claims in the subject patent application over the McBride et al Reference, United States Patent No. 6,296,752 issued October 2, 2001 from an application filed June 4, 1999, therefore, June 4, 1999 is the filing date of the application from which the McBride et al Reference matured;

(7) I have obtained copies of certain documents (The Documents) maintained in the ordinary course of business of the University of California, the Lawrence Livermore National Laboratory, and the United States Department of Energy (DOE) and I am one of the custodians of The Documents; copies of the documents are attached hereto as Attachments; The Documents show that The Inventors, Robin R. Miles, Kerry A. Bettencourt, and Christopher K. Fuller, made the invention described and claimed in the subject patent application (The Invention) in this country prior to June 4, 1999 and continuously worked on testing, developing, and patenting The Invention during the period from the time when they made the first written description of The Invention and disclosed

The Invention to others until their patent application was filed on December 8, 2000 (The Time Period);

(8) The Inventors, Robin R. Miles, Kerry A. Bettencourt, and Christopher K. Fuller completed a "RECORD OF INVENTION" a photostatic copy of which is attached hereto as Attachment A," which in the Conception of the Invention Section XI, contains an entry for the "Conception Date" and an entry for "First Written Description," and in the Reduction to Practice of the Invention Section XII, contains an entry for the "Date of Operation and Testing;" the dates on the photostatic copy of ATTACHMENT A have been blacked out, however, dates showing that The Inventors made The Invention prior to June 4, 1999 are dates prior to June 4, 1999; that The Inventors conceived The Invention in this country are dates prior to June 4, 1999; that The Inventors reduced The Invention to practice in this country are dates prior to June 4, 1999, and dates showing that The Invention was continuously worked on during The Time Period are dates during The Time Period;

(9) The Inventor, Robin R. Miles made drawings, made written descriptions, and made tests, of The Invention in this country prior to June 4, 1999, ATTACHMENT B is photostatic copy of "pages from Robin Miles' Laboratory Notebook" showing The Inventors made drawings, made written descriptions, and made tests of The Invention in this country prior to June 4, 1999;

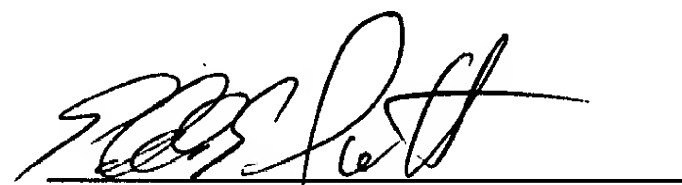
(10) The Inventor, Kerry A. Bettencourt made drawings, made written descriptions, and made tests, of The Invention in this country prior to June 4, 1999, ATTACHMENT C is photostatic copy of "pages from Robin Miles' Laboratory Notebook" showing The Inventors made drawings, made written descriptions, and made tests of The Invention in this country prior to June 4, 1999;

(11) During The Time Period the Industrial Partnership and Commercialization Office (IPAC) of the Lawrence Livermore National Laboratory held monthly Invention Review Meetings and The Invention was reviewed at the Invention Review Meetings during The Time Period; IPAC continuously reviews inventions and prioritizes inventions for patent application filing; The Invention was reviewed and prioritized by IPAC during The Time Period; photostatic copies of a database entries showing that The Invention was reviewed by IPAC during The Time Period is attached as Attachment D, the dates on the photostatic copy have been blacked out; however, dates showing that The Inventors made The Invention prior to June 4, 1999 are dates prior to June 4, 1999, and dates showing that The Invention was continuously worked on during The Time Period are dates during The Time Period;

(12) During The Time Period the Office of Laboratory Counsel (OLC) of the Lawrence Livermore National Laboratory, held monthly Invention Review Meetings and The Invention was reviewed at the Meetings during The Time Period; the Office of Laboratory Counsel (OLC) also held monthly meetings with the Industrial Partnership and Commercialization Office (IPAC) during The Time Period and The Invention was reviewed at the Meetings; OLC prepares patent applications for filing according to a priority list; the parent application of the subject application was prepared by OLC covering The Invention according to the priority list; photostatic copies of a database entries showing that The Invention was reviewed and a patent application filed by OLC during The Time Period is attached as Attachment E, the dates on the photostatic copy have been blacked out; however, dates showing that The Inventors made The Invention prior to June 4, 1999 are dates prior to June 4, 1999, and dates showing that The Invention was continuously worked on during The Time Period are dates during The Time Period;

(13) During The Time Period The Invention was continuously worked on; photostatic copies of documents maintained in the ordinary course of business of the University of California, the Lawrence Livermore National Laboratory, and the United States Department of Energy (DOE) showing that The Invention was continuously worked on during The Time Period are attached as Attachments F; the dates on the photostatic copies have been blacked out; however, dates showing that The Inventors made The Invention prior to June 4, 1999 are dates prior to June 4, 1999, and dates showing that The Invention was continuously worked on during The Time Period are dates during The Time Period;

(14) I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

A handwritten signature in black ink, appearing to read "Eddie E. Scott", written over a horizontal line.

(Signature)

Declarant: Eddie E. Scott

Dated: July 18, 2003
Livermore, California



RECORD OF INVENTION

Pag 4

LLNL File No.

IX. Inventor Information

Inventor's Permanent Home Address (Please attach a separate sheet for additional inventors.)

| Full Name | Citizenship | Street Address | City, State, Zip Code |
|--------------------|-------------|----------------------------------|-----------------------|
| Robin R. Miles | USA | 826 Cherokee Drive | Livermore, CA 94550 |
| Kerry Bettencourt | USA | 11873 West Vomac Road | Dubin, CA. 94568 |
| Christopher Fuller | USA | 1134 Portola Meadows Apt. 216 | Livermore, CA 94550 |

X. Funding Source

Funding Source or Project Under Which the Invention Arose (Include subcontracts, CRADAs, international agreements, work for others, or special project information.):

| | | | | | |
|------------------------|-------------------|---|--|-----|----|
| Funding Source Manager | | Phone # | Is funding presently being provided for development of your invention? | Yes | No |
| Pam Richmond | | 2-4965 | | X | |
| LLNL Acct # | B&R # | Please state the source of funds (if same as above, please so state): | | | |
| 8989-76 | 1/NO1 | | | | |
| Subcontract # | DOE Program Code | Do you reasonably expect future funding from the current source or other sources? | Yes | No | |
| | | | | | |
| CRADA # | Work for Others # | If yes, what is that source? | | | |
| | | | | | |

XI. Conception of the Invention

| | | | |
|---|------------------|------------------------------|-------------------------------------|
| Conception Date | Conception Place | | |
| | Livermore CA. | | |
| Earliest documentation of your invention (please provide date and identify the document): LDRD proposal | | First Sketch or Drawing Date | First Written Description Date 2/98 |
| Names of Witnesses or others with knowledge of facts relating to conception (preferably at least 2): | | | |
| Full Name | Organization | Telephone Number | |
| Ray Mariella | LLNL | 2-8905 | |
| Harold Ackler | LLNL | 2-6235 | |
| | | | |

XII. Reduction To Practice of the Invention

| | | |
|--|-------------------------------|--------------------|
| Date first model completed | Date of operation and testing | Place of test |
| | | LLNL, Livermore CA |
| Results of testing: | | |
| Worked. | | |
| Witnesses or others with direct knowledge of test (preferably at least 2): | | |
| Full Name | Organization | Telephone Number |
| Kerry Bettencourt | LLNL | 2-7371 |
| Robin Miles | LLNL | 2-5048 |
| Chris Fuller | LLNL | 4-5185 |

RECORD OF INVENTION

Page 5

LLNL File No.

XIII. Invention Use and Disclosure

| | | | |
|---|-----|-------------------------------------|--|
| Has the invention been put into use? | Yes | No | If yes, explain: |
| | | <input checked="" type="checkbox"/> | |
| Has the invention been disclosed to non-LLNL personnel? | Yes | No | If yes, to whom and when? Provide name(s) and date(s): |
| | | <input checked="" type="checkbox"/> | |
| If yes, was the disclosure done under a non-disclosure agreement? | Yes | No | Planning to write paper Jan '00 |
| | | | |

XIV. I/We believe myself/ourselves to be the first and original inventor(s) of the above-described invention.

| Inventor Signature | Date | Witness Signature | Date |
|----------------------------|------|------------------------|------|
| <i>[Signature]</i> | | <i>Sheryl Stockton</i> | |
| <i>Kyle Brith</i> | | <i>[Signature]</i> | |
| <i>Chad K. [Signature]</i> | | <i>S. Vasanthakodi</i> | |
| | | | |
| | | | |
| | | | |
| | | | |

XV. Classification Review

| | | | |
|--|-----------------------------|--------------------|----------------|
| Basis for unclassified release: | | | |
| <input checked="" type="checkbox"/> | Outside scope of AEA and EO | | |
| <input type="checkbox"/> | CG-DAR-1, Topic(s): | | |
| <input type="checkbox"/> | Other Guide(s): | | |
| Topic(s): | | | |
| UCNI | Yes | No | If YES, Guide: |
| | | | |
| Authorized Derivative Classifier -- Name and Title | | Signature | |
| <i>M. D. POCHA SECTION LEADER</i> | | <i>M. D. Pocha</i> | |
| Confirming Reviewer -- Name | | Signature | |
| | | | |

XVI. For LLNL Patent Group Use Only

Possible Statutory Bars

| | |
|--|------|
| Publication | |
| Public Use/Sale | |
| Recommended Filing Date Due to Possible Statutory Bars | |
| Preliminary Review By: | Date |
| | |

Send the completed and signed form to the Patent Group at L-703

| |
|----------------------------------|
| LLNL File No. <i>FL 10632</i> |
|----------------------------------|

XIII. Invention Use and Disclosure

| | | | |
|---|-----|-------------------------------------|--|
| Has the invention been put into use? | Yes | No | If yes, explain: |
| | | <input checked="" type="checkbox"/> | |
| Has the invention been disclosed to non-LLNL personnel? | Yes | No | If yes, to whom and when? Provide name(s) and date(s): |
| | | <input checked="" type="checkbox"/> | |
| If yes, was the disclosure done under a non-disclosure agreement? | Yes | No | <i>Planning to write paper</i> |
| | | | |

XIV. I/We believe myself/ourselves to be the first and original inventor(s) of the above-described invention.

| Inventor Signature | Date | Witness Signature | Date |
|-----------------------|------|--------------------------|------|
| <i>T. R. R.</i> | | <i>Henry Stockton</i> | |
| <i>Kyle Brith</i> | | <i>Don</i> | |
| <i>Chad R. Zeller</i> | | <i>S. Vasanthakumari</i> | |
| | | | |
| | | | |
| | | | |
| | | | |

XV. Classification Review

| | | | |
|--|-----------------------------|-------------------------|----------------|
| Basis for unclassified release: | | | |
| <input checked="" type="checkbox"/> | Outside scope of AEA and EO | | |
| | CG-DAR-1, Topic(s): | | |
| | Other Guide(s): | | |
| Topic(s): | | | |
| UCNI | Yes | No | If YES, Guide: |
| | | | |
| Authorized Derivative Classifier -- Name and Title | | Signature | |
| <i>M. D. POCHA SECTION LEADER</i> | | <i>M. D. Pocha</i> | |
| Confirming Reviewer -- Name | | Signature | |
| <i>Wm. A. BOLLINGER</i> | | <i>Wm. A. Bollinger</i> | |

XVI. For LLNL Patent Group Use Only

| | |
|--|------|
| Possible Statutory Bars | |
| Publication | |
| Public Use/Sale | |
| Recommended Filing Date Due to Possible Statutory Bars | |
| Preliminary Review By: | Date |
| | |

Send the completed and signed form to the Patent Group at L-703

LLNL - I. P. L. G.

LLNL File No.

IL-10632

This invention was made in the course of or under prime Contract No. W-7405-ENG-48 between the U.S. Department of Energy and the University of California. This Record of Invention is prepared for the Office of the Assistant General Counsel for Patents, U.S. Department of Energy.

I. Title of the Invention

Dielectrophoretic Concentration of Particles under Electrokinetic Flow

II. Inventor Information

| LLNL Inventor(s) (F M L) | Title/Position | Directorate | Payroll Acct | Phone # | Mail Stop |
|--------------------------|---------------------|-------------|--------------|---------|-----------|
| Robin Miles | Engineer | Engineering | 9782 | 2-5048 | L-223 |
| Kerry Bettencourt | Chemistry Associate | Chemistry | 9811 | 2-7371 | L-223 |
| Chris Fuller | Engineer | Engineering | 9782 | 4-5185 | L-223 |

III. Abstract

The use of dielectrophoresis to collect particles is well known when operating under pressure driven flow. However, to our knowledge, no one else has documented such collection under the conditions of electrokinetically-driven flow. Electrokinetically-driven flow is an important technique for moving fluids and sample around a microfluidic bio-chemical assay chip. We have now shown that it is possible to reap the advantages of dielectrophoretic manipulation in this regime.

IV. Uses of the Invention

List past uses, current uses and potential uses for your invention
LLNL or Government uses or possibilities for use:

Dielectrophoresis is used to effect motion on polarizable particles within a non-uniform electric field. Positive dielectrophoresis can be used to concentrate particles in areas of high electric field gradients. This can be used to eliminate the use of centrifuging to concentrate biological samples. Negative dielectrophoresis can be use to discriminate between various types of biological particles.

Commercial or other uses or possibilities for use:

Companies using microfluidic devices to perform analysis would be interested in using this device to concentrate the sample prior to testing.

V. Documents Describing the Invention

Documents, publications, and presentations describing the invention that you have published or prepared for publication, or presented on the subject. Also include presentations and publications planned within one year from now. Please attach a copy of preprints, articles, or viewgraphs.

| Title/Subject | Date | Publication # |
|---------------|------|---------------|
| None. | | |
| | | |
| | | |
| | | |
| | | |

VI. Documents Describing Prior Art (Please include copies of these documents.)

Related Documents (including patents, other publications) Please include patent numbers, authors, title, publication date, etc.

Many publications discuss dielectrophoretic concentration, but none that we know about use electrokinetic/electroosmotic-driven flow.

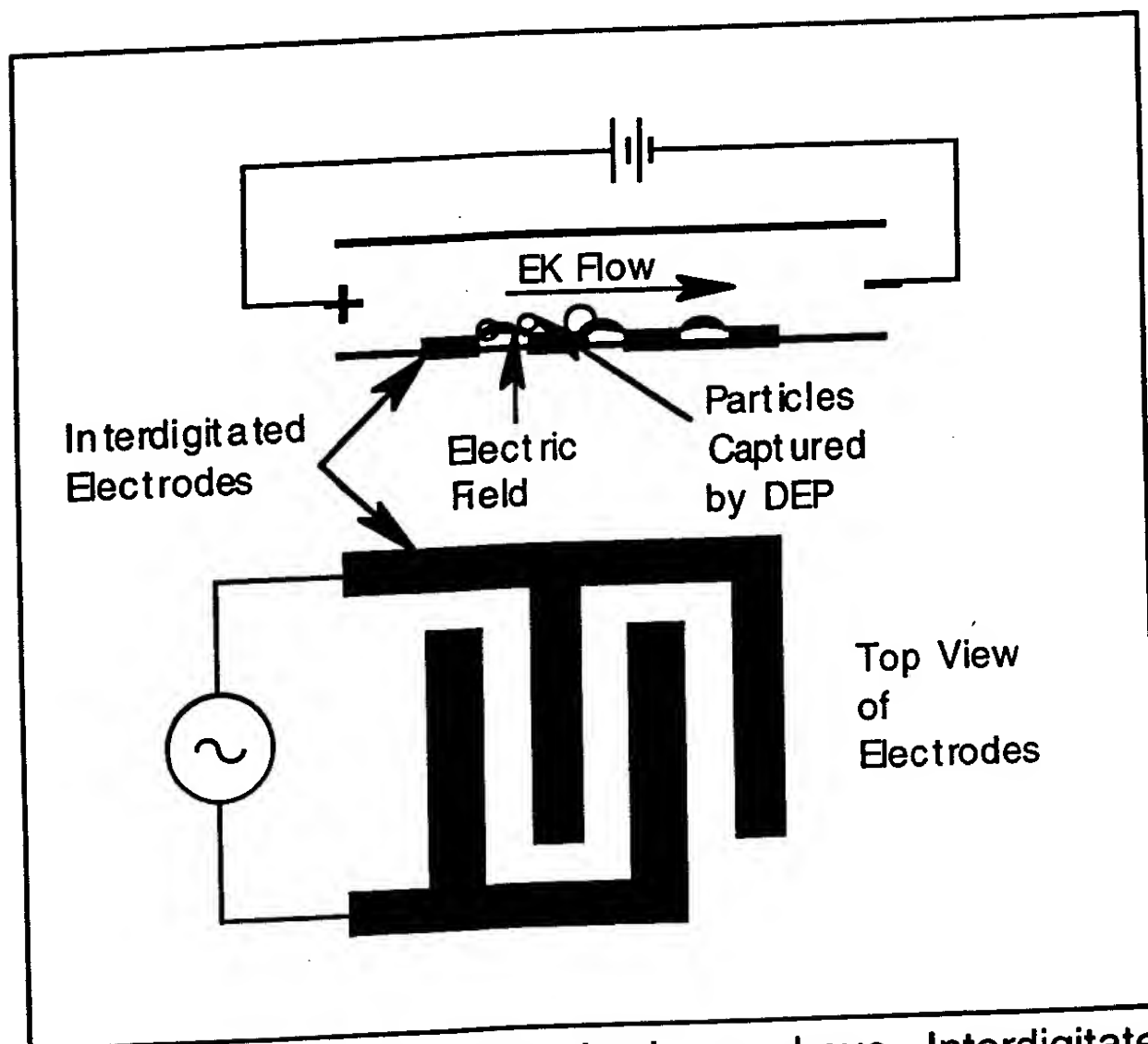
VII. Background

Background of the invention, including technical problems addressed by it:

Microfluidic devices are most useful when operating with small sample volumes. Small sample volumes result in increased reaction times and reduced reagent use which means significantly reduced costs for the multitude of tests that one desires to conduct on any given sample. Dielectrophoretic concentration of the sample is a useful method for achieving these goals. Dielectrophoresis is attractive on the microfluidic scale because the forces become significant and useful at dimensions of less than a 1 mm. Electrokinetic/electroosmotic flow is also useful in these devices because it obviates the need for micropumps and microvalves. The combination of dielectrophoresis and electrokinetic/electroosmotic flow would not normally be an obvious choice since one might think that the two electric fields and their associated double layers may interfere with each other. Also, DEP collection works best in the slow boundary-layer flow associated with pressure-driven flow. We have found that particles can still collect even in the more uniform flow field associated with electroosmotic flow. The 5-10 nm double charge layer associated with establishing electroosmotic flow does not seem to interfere or be interfered with by the DEP field in a significant way.

VIII. Invention Description

Description of the invention (you may also attach a paper). Please include a sketch of the invention, if possible.



A schematic of the device is shown above. Interdigitated electrodes are patterned on the inner surface of a microfluidic channel. Glass is the preferred material for the microfluidic channel because it promotes electroosmotic flow, particularly if preconditioned with sodium hydroxide. A DC voltage is applied across the ends of the channel to initiate the electrokinetic/electroosmotic flow field. An AC voltage is applied across the interdigitated electrodes to set up a non-uniform electric field capable of trapping particles using the dielectrophoretic force. Particles are swept down the channel electrokinetically and are trapped within the field established by the interdigitated electrodes. The particles can be released when the voltage to the interdigitated electrodes is released.

EO flow + electrodes.

400 V across ~ 10 cm,

3.8 V, 1 kHz 1 + 5 μ m beads - pH 8.0 soln.
pre prep w/ NaOH soln.

pattern guide/w Nitride.

fair amount of bubbles \rightarrow EO stopped bubbles on
electrodes in center.

step ① ④ Nothing

turn on EO / turn on Def.

collective seen bubble? no? (so) they merge

②

nothing

PEP increase field. - boiling

change electrode set

collect @ 3.8 V \rightarrow good collection

Start EO field. , 500 V

stuff still on edges after flow

turn off one side \rightarrow collect at oth side

release off + re collect

EO Flow then PEP \rightarrow stuff on electrode but not
near edges. \rightarrow release.

low stopper

300 V \rightarrow set voltage, put on field
3.8 V, 1 kHz \rightarrow demonstrated collect & release
w/ FO flow.

bubble at entrance stop flow \rightarrow

a few small
~~the~~ generated bubble at heligated electrode

\rightarrow run 2, 100 V 3.5 V 1 kHz

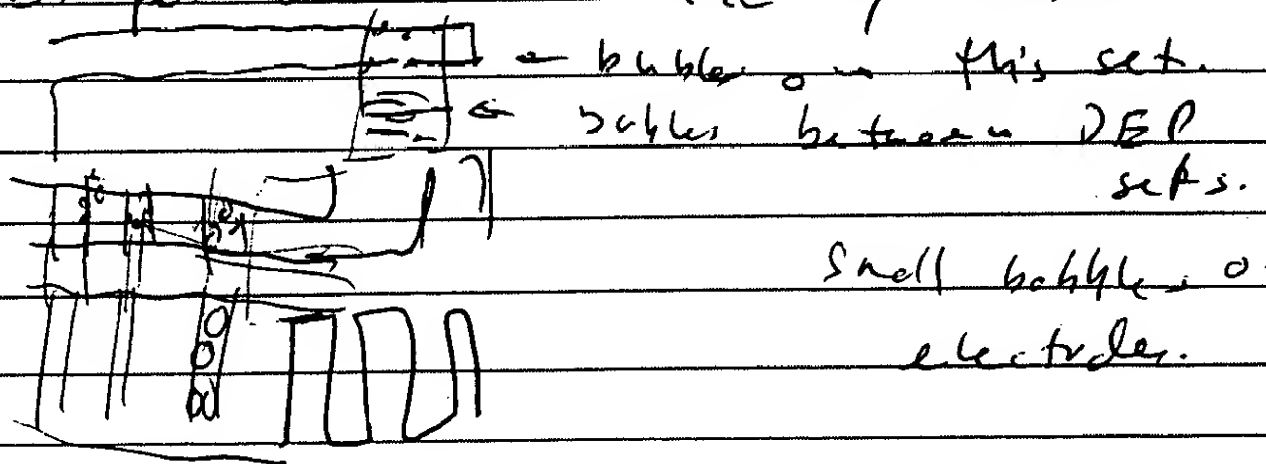
ph 8.0, 10% between .05% \approx .005%

the 200 V 3.4 \rightarrow 3.5 V

more bubbles. \leftarrow then 400 V 3.5 V
bubbles.

\leftarrow bubbles 400 V \rightarrow 3.8 V \rightarrow the data froths
mediately for the bubbles
on all sets of electrodes \rightarrow not
just DEP set.
conductive electrodes mostly.

bubbles seen on conductive electrodes for
DEP pair on other lane w/ heater



next section 100V

2.5V bounce cc start cap

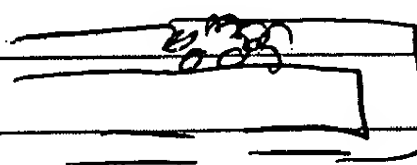
3.1V stab.

1.2V release

2.2V reception

small bubble noted

conduit electrode bubble



top connecting

leads to 2 DEP



lead to DEP on

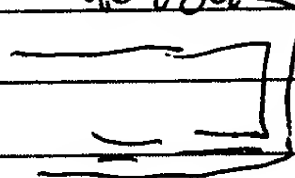


charged electrode at top of used DEP

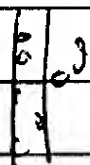
set 100V, water for bubbles & no DEP

first start top of conductive sensor 2-3m

in file bubble.



also fine wiring in nearest cathode



Green dge w/ Bg, 100V 1 kHz \rightarrow 10 kHz
up to 5V

Bg 100V, 3.8V 10 kHz

pure electrodes

100V 1 kHz 1/2 beads
8 ✓

no good connected

bubble still at incoming sensor

\rightarrow Pt electrodes 10/10

100V

6V 1 kHz

cut Sec when capture

200V

\rightarrow boiling

bubbles \rightarrow tip electrode, ^{of part of} top of 1st REP,
conduits on sides
not by heater

ATTACHMENT C

85

electro-osmotic flow

mixed 10 ml 1M NaCl with
1 drop 1M beads

When device hooked to high
voltage resistance is $\sim 200 \text{ K}\Omega$
(with solution on place)

Injected solution/beads in one
hole, plugged all but 2 others
which were filled with solution/
beads. After infusing/withdrawing
several times got resistance
down to $50 \text{ K}\Omega$ but then kept
climbing. It turned out solution
was leaking into other set of flow
channels. Sealed them off.

At start of tape resistance
measured $\sim 6 \text{ M}\Omega$

EO Anodically bonded
port Ti/Pt, no nitride resistance
measures $800 \text{ K}\Omega$

1M NaCl with 1M beads - same
conc. as above

Applied 500 V saw minimal motion
then power supply tripped off. Not
all beads moving only 1 layer

Maybe getting electrolysis/hydrolysis
lets test

Small beaker of 1M NaCl put
electrodes in solution - measured
resistance

It's very erratic with a low ≈ 3 Megohm. Every time electrodes are removed then put back in solution the value changes substantially. ≈ 3 Megohm ± 4 .

Applied 500 V to beaker with 1M NaCl in it. Within 1-2 sec foam & gas coming off one electrode. Small bubbles formed at the other. Beaker had ~ 14 of solution in it.

Let's try lower voltage - 250 V
- Same results

Let's try a more dilute NaCl solution 10 ml H_2O , 2 ml 1M NaCl.
- Same results but after a few seconds power supply tripped off (power supply trips at 400 mA)

Testing ~~CR~~ Pt heater ~~(could be CR with more to look in clean room for~~

There should be $\sim 2000 \Omega$ Pt
Resistance of device $\sim 330 \Omega$

| Voltage | Temp |
|---------|---------|
| 10V | 29°C |
| 15V | 36°C |
| 20V | 40-44°C |
| 24V | 70-72°C |
| 25V | |
| 22V | |

Above data not reproducible

MONTHLY REPORT
JULY 2003

ATTACHMENT D

| | | | | | | | | | |
|---------------------|--|--|--|------------------|--|-----------------|--|--|--|
| Directorate | | Program Bob Langland | | Priority # | | Review Comments | | Review Action Items | |
| Engineering | | Patents Al Thompson | | 1 | | Revisits | | Revisit March00. AM-Don't know what is being claimed. Sent Robin some open literature. RI -Revisit | |
| Month | | IP&C Bert Weis Amal Moulik | | 10632 | | Revisits | | AM-Don't know what is being claimed. Sent Robin some open literature. AM-Have not heard back from Robin. IM-This is good technology. BL-Would like to have this case bundled with other cases for possible outside patenting. Could put us in a better position to go to DARPA for funding. Robin appears to be very aware of what's happening in this area. AM-Haven't heard back from Robin. | |
| No Interest by IPAC | | Specialist | | Rights Requested | | Provisional | | KO-BIP for the Lynntech CRADA. Will be nominated for the Top 20. | |
| Account Nos. | | Paul Martin | | 8/4/2000 | | Filing Date | | Priority List | |
| 8989-76 | | <input type="radio"/> Requires Review <input type="radio"/> Inactivate <input type="radio"/> No Interest <input type="radio"/> Priority 1 <input type="radio"/> Refer to DOE <input checked="" type="radio"/> Waive & File <input type="radio"/> Waive | | 8/23/2000 | | Priority List | | Waive and File - Sara Microfluidics | |

Top 20 Program Priority Listing

| IL# | Directorat | Titl | Invent rs |
|----------|-------------|--|--|
| 10632 | Engineering | Dielectrophoretic Concentration of Particles under Electrokinetic Flow | Robin Miles, Kerry Bettencourt, Chris Fuller |
| Pri rity | 1 | | |

Patent Priority List - Scoresheet

High 20 Date:

IL #: 10632

Directorate: Engineering

Inventors: Robin Miles, Kerry Bettencourt, Chris Fuller

Title: Dielectrophoretic Concentration of Particles under Electrokinetic Flow

Non-LLNL

Inventors:

(Check all that apply)

High 20 Priority:

1

☒

R commended for the Top 20

☒

Important technical invention

☒

Commercial value

☒

Significant Programmatic interest

☒

Important LLNL portfolio (e.g. Aerogels)

☒

Proof of concept exists

☒

CRADA BIP

☐

CRADA Subject Invention

☐

License executed

☐

License in negotiation

☒

Commercial interactions/marketing

☐

Other time factors (bar date, provisional)

☐

Other (specify)

1

Bar Date:

Practical filing date:

Business Specialist:

Paul Martin

Publication Date:

Additional comments (Specialist/Program Rep)

BIP for CRADA TC-2016-00 with Lynntech.
Robin Miles, LLNL Inventor leaving the Laboratory to join Cepheid.

Engineering's Microfluidics portfolio

Selected by IPAC for Top 20 (Weis/Dunipace)

Added to Top 20 List

Search Completed

Portfolio

Microfluidics

| | | | | | | | | | | | |
|--|--|---|-----|-------------------------|--------------------------|-------------------|-------|-----------------------|---------|------|--|
| IL- 10632 | | IL Type | | N n-Lab Employee | <input type="checkbox"/> | C nt. App. | | Assigne | UC/IP&C | | |
| AIPA Applies | | | RL- | | | S- | 94234 | UC- | | | |
| Attorney | | Carnahan/Scott | | | Date Attorney Assigned | | | | | | |
| ROI Title | | | | | | | | | | | |
| Dielectrophoretic Concentration of Particles under Electrokinetic Flow | | | | | | | | | | | |
| Inv ntors | | | | | Non-LLNL Inventors | | | | | | |
| Robin Miles, Kerry Bettencourt, Chris Fuller | | | | | | | | | | | |
| Patent Status | | Final Office Action--resn due (ns) First Office Action--resp. due Response sent (kr). Patent Priority list 7/25/00 Abevnt status until Application in preparation. Patent Application sent to PTO | | | | | | | | | |
| Patent App. Title | | Dielectrophoretic Concentration of Particles under Electrokinetic Flow | | | | | | | | | |
| Case Combined With | | | | | | | | | | | |
| R lated Cases | | | | | | | | | | | |
| Attorney C mments | | | | | | | | | | | |
| Miscellaneous Information | | Home no. 925-362-8307. Chris Fuller new address: 1145 Hillcrest Ct. Livermore, wk; 408-739-7277, hm 443-9242. | | | | | | | | | |
| Account Nos. | | 8989-76 | | Directorate | | Engineering | | BandR No. | | YN01 | |
| No Interest by IPAC | | | | Inactivated by IPAC | | | | Inactivated by DOE | | | |
| Abandoned by | | | | Date Abandoned | | | | | | | |
| Disclosure Submitted | | | | Application Authorized | | | | Application Requester | | IP&C | |
| Rights Requested | | | | Type Requested | | Class Waiver W(C) | | Rights Granted | | | |
| Confirmatory License | | | | Priority | | 1 | | Application Mailed | | | |
| Provisional Serial No. | | | | Provisional Filing Date | | | | Priority | | | |
| Additional Provisional Serial No./Filing Date | | | | check priority date | | | | Export Control | | | |
| Serial No. | | 09/733857 | | Filing Date | | | | Bar Date 1 | | | |
| Patent No. | | | | Issue Date | | | | Bar Date 2 | | | |
| | | | | check priority date | | | | Bar Date 3 | | | |
| Publication Cite | | | | Publication Date | | | | EUVL | | | |
| | | | | | | | | EUVL Assignee | | | |
| Portfolio | | Microfluidics | | | | | | | | | |

IL Number
10632DUE DATES

IDS Due

IDS Sent

IL Number

10632

LLNI Pat nt Group - Pat nt Tracking

Restriction Req.
First Office Action
Second Office Action
Third Office Action
Fourth Office Action
Final Office Action
Notice of Appeal Due
Appeal Brief Due

Restriction Req. Sent
First OASent
Second OASent
Third OASent
Fourth OASent
Final OASent
Notice of Appeal Sent
(Check Response Due)
Appeal Brief Sent

CPA Filed RCE filed
1st CPA OA 1st CPA OA Sent 1st RCE OA 1st RCE OA Sent
2nd CPA OA 2nd CPA OA Sent 2nd RCE OA 2nd RCE OA Sent
Final CPA OA Final CPA OA Sent Final RCE OA Final RCE OA Sent

Notice of Allowance Notice of Allowance Sent
Notice of Allowability Notice of Allowability Sent

Response Due Multiple Due Dates ☐ FOA NOA

MAINTENANCE FEES

Three Yr Fee Due Three Yr Fee Paid Three Year Amount
Seven Yr Fee Due Seven Yr Fee Paid Seven Year Amount
Eleven Yr Fee Due Eleven Yr Fee Paid Eleven Year Amount
Small Entity ☐ Yes ☐ No

IL Number **10632**

IP&C INFORMATION

Licensee

Licensing Specialist

Paul Martin

Date Assigned

Search Requested Search Completed Search Sent To **Robin Miles**

Last Modified Date Last Modified By: **Raymond3** Last Modified Time **7:27:49 AM**

Abstract

Pat nt Application U.S. Pat nt

DISCLOSURES, PATENT APPLICATIONS AUTHORIZED AND FILED

| Direct rate/ AD | Account N . | IL# | Title | Invent r | Assignee | Sp cialist | Disclosure Submitted | Applicati n Auth rized |
|--------------------|----------------|-------|--|--|----------|------------|-------------------------|---------------------------|
| | 8989-76 | 10632 | Dielectrophoretic Concentration of Particles under Electrokinetic Flow | Robin Miles, Kerry Bettencourt, Chris Fuller | UC/IP&C | | | |

*Disclosures assigned to DOE unless assignment requested by LLNL.

**UC/OTT Alameda is the Technology Transfer Office for The Regents

Cases Currently on the High 20

| IL# | Title | Inventors | Added to List |
|------------|--|--|----------------------|
| 10632 | Dielectrophoretic Concentration of Particles under Electrokinetic Flow | Robin Miles, Kerry Bettencourt, Chris Fuller | |

| Record | Invention Title | Inventors | Filing Date | Patent Number | Issue Date |
|--------|--|--|-------------|---------------|------------|
| | Dielectrophoretic Concentration of Particles under Electrokinetic Flow | Robin Miles, Kerry Bettencourt, Chris Fuller | | | |

| | | | | | | |
|-------------------------------|--|--|--|--|--|--|
| Account N s. | 8989-76 | | | | | |
| Additional Provisional Serial | No. Filing Dat | | | | | |
| Agents File Nos. | | | | | | |
| Appeal Brief Du | | | | | | |
| Appeal Brief S nt | | | | | | |
| Applicant | | | | | | |
| Application Authorized | | | | | | |
| Application Mailed | | | | | | |
| Application Requester | IP&C | | | | | |
| Assignee | UC/IP&C | | | | | |
| Attorney | Carnahan/Scott | | | | | |
| Attorney Foreign | Scott | | | | | |
| Attorney Comments | | | | | | |
| BandR No. | YN01 | | | | | |
| Cas Combined with | | | | | | |
| Confirmatory License | | | | | | |
| Cont. App. | | | | | | |
| Countries | | | | | | |
| Date Att. Assign. | | | | | | |
| Directorate Priority | 1 | | | | | |
| Disclosure Submitted | | | | | | |
| Eleven Year Amount | | | | | | |
| Eleven Yr Fee Due | | | | | | |
| El ven Yr Fee Paid | | | | | | |
| Filing Date | | | | | | |
| Final OA Sent | | | | | | |
| Final Office Action | | | | | | |
| First OA Sent | | | | | | |
| First Office Action | | | | | | |
| For. Response Due | | | | | | |
| Foreign Agents | | | | | | |
| Foreign Status | IPAC notified us not to proceed with the | | | | | |
| Foreign Title | | | | | | |
| Fourth OA Sent | | | | | | |
| Fourth Office Action | | | | | | |
| IDS Due | | | | | | |
| IDS Sent | | | | | | |
| IL Index Key | 10632 | | | | | |
| IL Number | 10632 | | | | | |
| IL suffix | | | | | | |
| " T - - - - | | | | | | |

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|-----------------------------|--|--|--|--|--|--|--|
| IL Type | | | | | | | |
| Inactivated by DOE | | | | | | | |
| Inactivated by IPAC | | | | | | | |
| International Filing Date | | | | | | | |
| International Serial No. | | | | | | | |
| Inventors | Robin Miles, Kerry Bettencourt, Chris Fuller | | | | | | |
| IPAC PCT Req. | | | | | | | |
| Last Modified Date | | | | | | | |
| Last Person To Modify | Raymond3 | | | | | | |
| Last Modified Time | 7:27:49 AM | | | | | | |
| Licensee | | | | | | | |
| Miscellaneous Information | | | | | | | |
| Natl Appl. Nos. | | | | | | | |
| Notice of Allowability | | | | | | | |
| Notice of Allowability Sent | | | | | | | |
| Notice of Allowance Date | | | | | | | |
| Notice of Allowance Sent | | | | | | | |
| Notice of Appeal Due | | | | | | | |
| Notice of Appeal Sent | | | | | | | |
| Patent App. Title | Dielectrophoretic Concentration of Particles under | | | | | | |
| Patent Issued Date | | | | | | | |
| Patent Number | | | | | | | |
| Patent Status | Final Office Action--resp due 8/8/2003 (ns) First Office | | | | | | |
| PCT Due | | | | | | | |
| PCT I National Entry | | | | | | | |
| PCT II Demand Due | | | | | | | |
| PCT II Demand Filed | | | | | | | |
| PCT II National Entry | | | | | | | |
| Priority Date | | | | | | | |
| Provisional Filing Date | | | | | | | |
| Provisional PCT Due | | | | | | | |
| Provisional Serial No. | | | | | | | |
| Publication Cite | | | | | | | |
| Publication Date | | | | | | | |
| Related Cases | | | | | | | |
| Response Due | | | | | | | |
| Restriction Req. Sent | | | | | | | |
| Restriction Requirement | | | | | | | |
| Rights Granted Date | | | | | | | |
| Rights Requested Date | | | | | | | |
| RL Number | | | | | | | |

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|-----------------------------|--|--|--|--|--|--|
| ROI Title | Dielectrophoretic Concentration of Particles under | | | | | |
| S Number | 94234 | | | | | |
| S cond OA S nt | | | | | | |
| Second Office Action | | | | | | |
| S rial Number | 09/733857 | | | | | |
| S ven Y ar Amount | | | | | | |
| Seven Yr Fee Due | | | | | | |
| Seven Yr Fee Paid | | | | | | |
| Third OA Sent | | | | | | |
| Third Office Action | | | | | | |
| Three Year Amount | | | | | | |
| Three Yr Fee Due | | | | | | |
| Three Yr Fee Paid | | | | | | |
| Type Requested | Class Waiver W(C) 92-002 | | | | | |
| UC number | | | | | | |
| Patent Expiration Date | | | | | | |
| For ign Patent No. | | | | | | |
| Foreign Issue Date | | | | | | |
| Prov. PCT Due Date | | | | | | |
| Non-Lab Employee | | | | | | |
| Modification Index | 2003181.07274 | | | | | |
| No Interest by IPAC | | | | | | |
| High 20 Nominated Candidate | | | | | | |
| High 20's List | | | | | | |
| Omit | <input checked="" type="checkbox"/> | | | | | |
| Priority | | | | | | |
| Bar Date 1 | | | | | | |
| Foreign Bar Date | | | | | | |
| Bar Date 2 | | | | | | |
| Bar Date 3 | | | | | | |
| Bar Date Comments | | | | | | |
| Portfolio | Microfluidics | | | | | |
| Abstract | | | | | | |
| Int'l Search Report | | | | | | |
| Written Opinion | | | | | | |
| Response Sent | | | | | | |
| Small Entity | | | | | | |
| Int'l Pre Exam Rpt | | | | | | |
| FOA NOA | FOA | | | | | |
| CPA Filed | | | | | | |
| First CPA Office Action | | | | | | |

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|-----------------------------|-------------|
| First CPA Office Action | |
| Sec nd CPA Office Action | |
| Final CPA Office Acti n | |
| First CPA OA S nt | |
| Second CPA OA S nt | |
| Final CPA OA S nt | |
| EUVL | |
| EUVL Assignee | |
| Search Requested | |
| Search Completed | |
| Search Sent To | Robin Miles |
| For. Miscellaneous Info | |
| Prov PCT Request Sent | |
| PCT Request Sent | |
| Search Report Resp Sent | |
| ISA | |
| IPEA | |
| R qu st to Outside Counsel | |
| Supp Int'l Search Rpt Rec'd | |
| Supp Search Rpt Resp | |
| Int'l Pre Exam Resp | |
| Written Opinion Resp | |
| National Countries | |
| National Fees | |
| PCT Pub Date | |
| PCT Pub Sent Inv. | |
| AIPA Applies | |
| Non LLNL Inventors | |
| Multiple Due Dates | |
| Multiple Foreign Due Dates | |
| RCE filed | |
| First RCE Office Action | |
| First RCE Office Sent | |
| Second RCE Office Action | |
| Second RCE Office Sent | |
| Final RCE Office Action | |
| Final RCE Office S nt | |
| Patent Application | |
| U.S. Patent | |



University of California
Lawrence Livermore National Laboratory
Intellectual Property Law Group

Mail Station: L-703
Extension: 2-0505

Interoffice Memorandum

TO: Bill Bollinger

FROM: Terry Contreras

A handwritten signature in black ink, appearing to be 'TC' or similar initials.

SUBJECT: New Disclosure and Record of Invention
LLNL Case No.: IL- 10632

Please review the attached disclosure for both export control and classification purposes. When you have finished your review please sign the disclosure and return to me at L-703.



University of California
LAWRENCE LIVERMORE NATIONAL LABORATORY
Intellectual Property Law Group

Mr. William C. Daubenspeck
Office of Patent Counsel
Intellectual Property Law Division
Livermore, California 94550

SUBJECT: Invention Case No.: IL-10632
"Dielectrophoretic Concentration of Particles under Electrokinetic Flow"
By: Robin Miles, Kerry Bettencourt and Chris Fuller

Dear Mr. Daubenspeck:

Enclosed are the original and one copy of the combined Disclosure and Record of Invention in the subject case.

Very truly yours,

A handwritten signature in cursive script that reads "K Sudweeks".

Kjersti Sudweeks
Intellectual Property Law Group

Enclosure

cc: Penny Hennagir w/enc
IP&C Sara Sanders L-795 w/enc
Robin Miles L-223 w/enc
Kerry Bettencourt L-223 w/enc
Chris Fuller L-223 w/enc

Interdepartmental Letterhead

Mail Station L-312

LLNL - I. P. L. G.

EC-99-255

Ext: 4-3483

To: Terry Contreras, L-703

From: William R. Fritchie

Subject: Export Control Review for IL-10632 "Dielectrophoretic Concentration of Particles under Electrokinetic Flow"

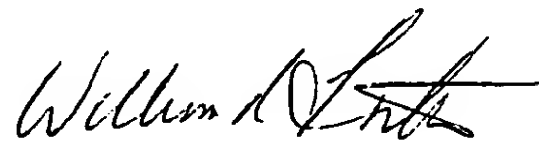
Review of Regulations. An export control review of the subject technology was conducted using the following applicable regulations:

Nuclear Regulatory Commission (NRC). This technology is export controlled as Sensitive Technology under the NRC Regulations (10 CFR Part 110), dated Yes___ No_X_
[web site: http://www.access.gpo.gov/nara/cfr/waisidx_99/10cfr110_99.html]
Department of Energy (DOE). This technology is export controlled as Sensitive Technology under the DOE Regulations (10 CFR Part 810), dated Yes___ No_X_
[web site: http://www.access.gpo.gov/nara/cfr/waisidx_99/10cfr810_99.html]
Department of State (DOS). This technology is export controlled under the DOS International Traffic in Arms Regulations (ITAR) (22 CFR Parts 120-130), dated Yes___ No_X_
[web site: http://www.access.gpo.gov/nara/cfr/waisidx_99/22cfrv1_99.html]
Department of Commerce (DOC). This technology is export controlled under the DOC Export Administration Regulations (EAR) (15 CFR Parts 730-774) dated Yes_X_ No___
[web site: http://www.access.gpo.gov/bxa/ear/ear_data.html]

Narrative. This technology is export controlled by the DOC EAR (15 CFR Part 774, Category 6, specifically ECCN EAR99), and requires no license for export, subject to the following caveat:

This technology may not be exported to individuals on the current Denied Persons List (15 CFR Part 764, Supplement 2) or to the presently embargoed countries of Cuba, Libya, North Korea, Iran, Iraq, Rwanda, Liberia, Somalia and Yugoslavia (15 CFR Part 746).

Separate license requirements may apply for the export of commodities associated with this technology. For additional licensing guidance, contact Lou Hill (Traffic/Shipping) at 424-4201.



William R. Fritchie
Classification Adviser

cc: Nancy Stone, L-703
Sara Sanders, L-795



University of California
LAWRENCE LIVERMORE NATIONAL LABORATORY
Intellectual Property Law Group

Ms. Janet Rego
Office of Patent Counsel
Intellectual Property Law Division
Livermore, California 94550

SUBJECT: Missing page

Dear Janet:

Janet: around December 28 (that is when letter was dated) you received these records of invention:

10627
10628
10629
10630
10631
10632 ✓
10633
10634

There was a sheet missing from them. The sheet that was missing is where our classification office (Bill Bollinger) signs. I am sending you the original signature and a copy for each of the ILs listed above. Sorry for the inconvenience.

Very truly yours,

Terry Contreras
Intellectual Property Law Group

Enclosure



Department of Energy
Oakland Operations Office
Office of Chief Counsel
Intellectual Property Law Division

Livermore Office
P.O. Box 808, L-376
Livermore, CA 94550
(925) 422-4367
FAX (925) 422-8228

Janet G. Tulk, Laboratory Counsel, L-703

RECEIVED

Subject: DOE Patent Docket No.: S-94,234
LLNL Docket No.: IL-10632
Title: Dielectrophoretic Concentration of Particles under Electrokinetic Flow
Inventor(s): Robin Miles et al.
Under DOE Contract No.: W-7405-ENG-48


LLNL-I.P.L.G.

The Laboratory's transmittal to this office on _____ of the above-identified invention disclosure is acknowledged with appreciation. The invention disclosure has been assigned the above-indicated DOE Patent Docket (S) number. Your reference to this number in future communications with this office will be helpful.

Based on the information provided to DOE in the invention disclosure, the commercial rights to this invention are readily obtainable by the Laboratory during the first two years following disclosure of the invention to DOE under the provisions of the above contract. As set forth in Clause 7.7 of the contract, if the Laboratory wants the commercial rights to the invention, the Laboratory must elect to retain title within the two-year period. However, if public disclosure, use or sale of the invention has initiated the one year statutory period to apply for U.S. patent protection, the period for election of title is shortened by DOE to end 60 days before the end of the U.S. statutory period. Therefore, it is important for this office to be notified immediately about any public disclosure, use or sale.

In an effort to give the Laboratory as much latitude as possible to decide on commercialization of the invention, this office of DOE will hold the invention in abeyant status for a period of two years from the above date of invention disclosure. Generally during this abeyant status period, DOE takes no action on protecting the invention by the filing of a U.S. patent application. Instead DOE relies on the Laboratory to carefully evaluate the invention's potential and decide whether or not to obtain the commercial rights in the invention. If the Laboratory elects to retain title to the invention, the Laboratory must file a patent application within one year of the date of election plus any extensions granted by DOE but, in any event, before the expiration of any statutory bar period. However, during the two-year period for election, should the Laboratory decide not to retain title and inform DOE in writing, DOE will at that time evaluate whether the filing of a U.S. patent application is warranted to meet the Government's needs. If the Laboratory decides not to retain title to the invention, you are encouraged to notify DOE at your earliest convenience.

If there are any questions concerning this letter or DOE actions, please feel free to contact this office.


William C. Daubenspeck
Patent Attorney

cc: Karena McKinley, LLNL, L-795
Robin Miles, LLNL, L-223
Kerry Bettencourt, LLNL, L-223
Chris Fuller, LLNL, L-223

WCD:JLR:wkc



Lawrence Livermore National Laboratory
Industrial Partnerships & Commercialization

Janet G. Tulk
Laboratory Counsel
LLNL, L-703

Subject: DOE Case No. S-94234
LLNL Docket No. IL-10632
Invention Title: Dielectrophoretic Concentration of Particles under
Electrokinetic Flow
Inventors: Robin R. Miles, Christopher K. Fuller,
Kerry A. Bettencourt

Dear Ms. Tulk:

This letter is to request that you prepare and file a U.S. patent application for the above-referenced matter on behalf of The Regents of the University of California. A waiver concerning the subject invention has been prepared and is being submitted to DOE OAK. A copy is enclosed for your file. Foreign filing is not requested at this time but will be revisited at a future date. We ask that your office track the foreign file date(s) and keep us accordingly advised.

Please proceed with this application for filing with the U.S. Patent Office in a timely manner.

Please send a copy of the patent application as filed, serial number, and filing data as they become available to Nina Rhodes and keep her advised regarding the progress of the filing.

At this time I ask that your office track the patent filing fees and prosecution costs for the subject application and keep our office informed of the expenditures required.

Sincerely,

Kathy Kaufman
for Karena McKinley
Director, Industrial Partnerships &
Commercialization

Attachment
cc: Kerry A. Bettencourt, L-223
Kevin C. O'Brien, L-795



Lawrence Livermore National Laboratory
Industrial Partnerships & Commercialization

Mr. William C. Daubenspeck
Office of Patent Counsel
U.S. Department of Energy
Oakland Operations Office
P.O. Box 808, L-376
Livermore, CA 94550

Subject: NOTICE OF ELECTION TO RETAIN TITLE TO DEFENSE
PROGRAM INVENTION UNDER CLASS WAIVER W(C)-92-002

Dear Mr. Daubenspeck:

Pursuant to the terms of Contract W-7405-ENG-48 between the Department of Energy (DOE) and the Regents of the University of California (University), and subject to Class Waiver W(C)-92-002, we submit an Election Memorandum for the following invention:

DOE Case No. S-94234
LLNL Docket No. IL-10632
Dielectrophoretic Concentration of Particles under Electrokinetic Flow
Inventors: Robin R. Miles, Christopher K. Fuller, Kerry A. Bettencourt

The University has reviewed the subject invention disclosure with respect to: (1) export control; (2) United States preference/competitiveness; and (3) adverse impact upon the Naval Nuclear Propulsion Program and other nuclear and/or atomic energy defense activities of the Department of Energy and agrees to comply with all statutes and regulations governing export control, U.S. preference/competitiveness, and the Naval Nuclear Propulsion Program, et al., in dealing with the subject inventions. (A copy of the Invention Disclosure including a Classification Review, and an original signed Export Control Review for Licensing and Patents form are attached to the enclosed Election Memorandum.)

Further, the University agrees to comply with Clause 66.1.F governing technology transfer activities under Contract Number W-7405-ENG-48.

Your prompt review of this Election Memorandum will be appreciated.

Sincerely,

Kathy Kaufman
for Karena McKinley
Director, Industrial Partnerships
& Commercialization

cc: Kerry A. Bettencourt, L-223
Kevin C. O'Brien, L-795
Janet G. Tulk, L-703

WAIVER LEGAL APPROVAL

Date:

IL File No: 10632

Document Type:

- DP Class Waiver
- Election Letter

- CRADA - Class Waiver
- Ext. of Time (Class Waiver)

Description: _____

RECEIVED

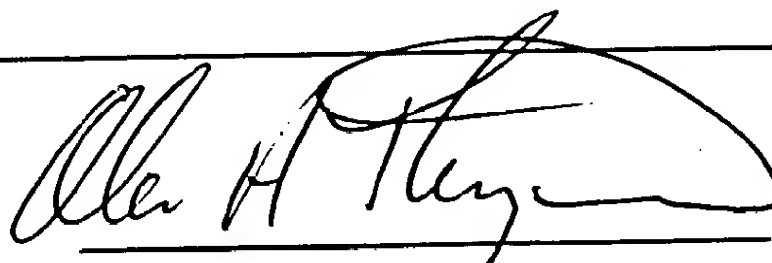
LLNL-I.P.L.G.

Document needs the following:

- X Legal/Patent Review _____
- _____ Additional Approval(s) _____
- _____ Other _____

Reviewer comments: _____

Approved as to Legal Form



Signature

Date

Return to: Name: Sara Sanders

Extension: 3-0381

L-Code: 795

☐ Please Call for Pick-up

X-Sender: e03a497@popsicle.llnl.gov
Date: 16:14:22 -0700
To: thompson52@llnl.gov
From: Bert Weis <weis1@llnl.gov>
Subject: Microfluidics Cases

Hi Al:

Here are the top six cases of this portfolio from Engineering. They rank-ordered a total of 12 cases for me. I also have a list of four cases from NAI, but didn't include any of these, partly because I am not sure if the offer to pick up part of the tab includes NAI. (They may not have any money). But one of the cases is 10629 (The magnetohydrodynamic mini-centrifuge), which people really liked, although it is different from the other cases below.

The following is a list of top six cases belonging in the Engineering portfolio. All cases were rated as priority one during the reviews. They are presented in the order they were ranked. Please note that many of these cases have Robin Miles as an inventor. (Robin has decided to leave the Laboratory and join Cepheid.)

1. IL-10632 Robin Miles et al

Dielectrophoretic Concentration of Particles under Electrokinetic Flow.

Bud (This is done by causing a fluid, which carries particles at a low concentration, to flow over a series of interdigitated electrodes by applying a DC field across the entire device structure. An AC field is applied to the electrodes. This causes the particles carried by the fluid to become trapped and concentrated between the electrodes. The particles can then be released by turning off the AC field at a desired point in time.)

Chris Fuller
- Paper -

Bud 2. IL-10416 Robin Miles et al.

Use of Impedance Measurements to detect the Endpoint of DNA Amplification. (An enzyme releases an ionic rather than a fluorescent tag at the amplification endpoint. This causes the impedance of the fluid to change which can be detected less expensively, thus simplifying the instrumentation and making the equipment more economical.)

No RDP
Chris Fuller
Lynntech
close process
RTP

3. IL-10404 Robin Miles. Use of Impedance Measurements to Detect the Presence of Pathogens trapped in Electric Fields.

(Impedance measurements is used to detect and measure particles concentrated between the electrodes, providing a means to monitor what is going on.)

Chris Fuller

4. IL-10406 Robin Miles et al. Use of Impedance Measurements to Detect the Presence of Pathogens Attached to Antibody-Coated Beads.

(Here they exploit the fact that impedance changes when particles attach to the beads which are coated to bind them. Measurement of the impedance provides information as to presence and concentration of the pathogens.)

Chris Fuller

5. IL-10373 Robin Miles et al. Stepped Electrophoresis for Movement and Concentration of DNA.

(Apparatus similar to that of #1, except that there are individual electrodes, which can be charged individually or in groups to be able to herd to trapped particles by manipulating the electric fields.)

RTP

Published by L-222

6. IL-10331 Robin Miles. Movement of Particles Using Sequentially Activated Dielectrophoretic Particle Trapping.

(Similar to #5. But specifically mentions sequentially trapping and moving the particles and has greater detail regarding the apparatus for accomplishing it.)

NO +st
NO RTP



University of California
Lawrence Livermore National Laboratory
Intellectual Property Law Group

Mail Station: L-703

Extension: 2-7273

Interoffice Memorandum

TO: Chris Fuller L-223

FROM: L.E. Carnahan

SUBJECT: LLNL Docket No.: IL-10,632
"Dielectrophoretic Concentration of Particles
Under Electrokinetic Flow"

Enclosed is a modified draft of a patent application forward to you or covering the above-identified invention for review by yourself and other co-inventor R. Miles and K. Bettencourt. It is understood that Robin Miles is no longer at LLNL.

Please fill in the blanks and make any additions or changes needed to fully describe the invention. If the invention has been described in any report or paper, please provide a copy, and if published also provide the date and place of publication.

In view of the high interest in the invention, return of the draft, along with comments **within three weeks** after receipt thereof is requested.

Teresa Walls for
L.E. Carnahan, Patent Advisor

LEC:tw
Enclosure

X-Sender: e10a444@poptop.llnl.gov
Date: Mon, 14:36:18 -0700
To: Teresa Walls <walls4@llnl.gov>
From: Kathy Berson <bereson1@poptop.llnl.gov>
Subject: Re: Small or Large Entity

Teresa,
These are all small.
>Kathy,
>Are these small or large entity
>IL-10697,
>IL-10661
>IL-10632
>Thanks,
>Teresa

Kathy L. Berson
bereson1@llnl.gov
Lawrence Livermore National Laboratory
PO Box 808, Mail Stop L-795
Livermore, Ca 94551-0969
510-422-2111 voice
510-423-8988 fax



Department of Energy
Oakland Operations Office
Office of Chief Counsel
Intellectual Property Law Division

Livermore Office
P.O. Box 808, L-376
Livermore, CA 94550
(925) 422-4367
FAX (925) 422-8228

Karena McKinley
Director, Industrial Partnership and Commercialization
Lawrence Livermore National Laboratory, L-001
c/o Sara Sanders, LLNL-TTIP, L-795

RECEIVED

LLNL-I.P.L.G.

SUBJECT: DOE Patent Case: S-94,234
Title: Dielectrophoretic Concentration of Particles under
Electrokinetic Flow
Docket No.: IL-10632
DOE Contract No: W-7405-ENG-48
Waiver No.: W(C)-92-002-721

Your transmittal to this office of the subject class waiver is acknowledged with appreciation.

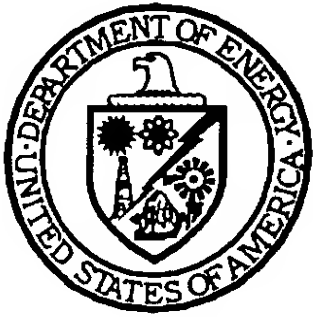
The class waiver has been assigned the W(C) number identified above. Your reference to this number in future communications with this office will be helpful.

Very truly yours,

Janet L. Rego
Legal Instruments Examiner

Copy to: Janet G. Tulk, LLNL, L-703

JLR:wkc



Department of Energy
Oakland Operations Office
Office of Chief Counsel
Intellectual Property Law Division

Livermore Office
P.O. Box 808, L-376
Livermore, CA 94550
(925) 422-4367
FAX (925) 422-8228

Karena D. McKinley
Director, Industrial Partnership and Commercialization
Lawrence Livermore National Laboratory, L-795
c/o Sara Sanders, LLNL-TTIP, L-795

✓ **Re: Approval of Election by LLNL under DOE Waiver W(C) 92-002-721**
DOE Inven. Case No.: S-94,234
LLNL Inven. Docket No.: IL-10632
Inventor(s): Robin Miles et al.
Invention Title: Dielectrophoretic Concentration of Particles under Electrokinetic Flow

Dear Ms. McKinley:

Enclosed with this letter is a copy of the LLNL Election Memorandum for the above-identified invention. It has the signatures of the appropriate DOE officials approving LLNL's election. The effective date of DOE's approval is _____

Please have the LLNL Patent Group forward to this office a copy of each patent application filed on the referenced invention and a copy of any issued patents thereon.

Furthermore, have LLNL's Industrial Partnerships and Commercialization Program periodically provide this office with information demonstrating LLNL's commercialization efforts for the subject invention as required by Contract No. W-7405-ENG-48.

Respectfully,

William C. Daubenspeck
Patent Attorney

Enclosure

Copy to: Michael A. Wahlig, DOE-OAK, L-293 (w/o encl)
Janet G. Tulk, LLNL, L-703
Robin Miles, LLNL, L-223 w/o encl)
Kerry Bettencourt, LLNL, L-223 (w/o encl)
Christopher Fuller, LLNL, L-223 (w/o encl)
Betty Winchester, DOE-HQ/Patents (w/o encl)

WCD:JLR:wkc

CONTAINS PROPRIETARY INFORMATION

ELECTION MEMORANDUM

DATE:

SUBJECT: Notice of Election to Retain Title to the Following Defense Program
Subject Invention Under Class Waiver W(C)-92-002

FROM: LLNL Industrial Partnerships & Commercialization, L-795
Nina Rhodes/Sara Sanders, Administrators, (925) 422-6416

TO: Assistant Chief Counsel for Patents, DOE/OAK

DOE NO: S-94,234

DATE REPORTED TO DOE:

FIRST NAMED INVENTOR: Robin Miles

INVENTION TITLE: Dielectrophoretic Concentration of Particles
under Electrokinetic Flow

B&R NUMBER: YN01

DOE PROGRAM OFFICIAL: N/A

A copy of the Subject Invention Disclosure is attached hereto.

The Regents of the University of California (UC) hereby elects to retain title to the Subject Invention, under the terms and conditions of the Statement of Consideration of Class Waiver W(C)-92-002, in the United States and such foreign countries as may be determined. We will advise DOE of any foreign filing decisions and actions taken by the University.

UC hereby represents that it has conducted a reasonable internal inquiry, and as a result, it has determined that the Subject Invention falls within the Class Waiver. UC has further determined that the Subject Invention does not fall within international agreements or treaties of the U.S. Government.

UC further represents that it will attempt to commercialize the Subject Invention through its licensees within five (5) years from the time this election is effective. UC

agrees to file, prosecute, and maintain those patent applications and issued patents on the Subject Invention which are necessary to effectively fulfill its obligations under the subject Class Waiver and its Technology Transfer Agreement entered into with the Department of Energy (DOE) on January 23, 1991, under Contract No. W-7405-ENG-48.

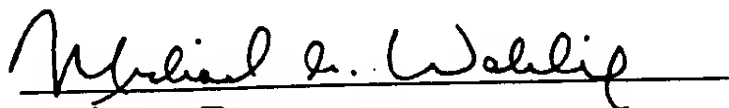
UC has provided for the following safeguards for the protection of national security while commercializing the Subject Invention:

UC further represents that it has determined that the technology has been reviewed for export control. See the attached Export Control Review for Patents and Licensing form attached hereto and incorporated herein as if fully set forth. UC further represents that it will inform all licensees of any requirements or limitations on export of the technology.

In making its determination that the Subject Invention falls within the subject Class Waiver, UC has concluded, through its Program and Technology Transfer Offices, that national security will not be compromised by the development, commercialization or licensing activities involving the invention; that no sensitive technical information (classified or unclassified) under any of DOE's programs will be released to unauthorized persons; that the dissemination of the technology will not contribute to the proliferation of nuclear weapons; and that there will be no adverse effect on the operation of the Naval Nuclear Propulsion Program or the Nuclear Weapons Program or other defense activities of DOE by UC taking title.


UC understands that an election of Defense Programs funded inventions is not effective until approval by the DOE Assistant Chief Counsel for Intellectual Property and concurrence by the Defense Programs Field Review Official is obtained.

CONCURRENCE:


Defense Programs

Date: _____

APPROVAL:


William C. Daubenspeck
for Asst. Chief Counsel for Patents, OAK

Effective Date: _____



Dear Robin,

I'm sending you a copy of IL-10404 which was sent to your prior address. And I'm sending you a copy of IL-10632 which was sent to Chris Fuller here at the Lab and Bud Carnahan thought I should also sent it to you.
Also a copy of drawing for IL-10416

Thank You,

A handwritten signature in cursive script, reading "Teresa Walls".

Teresa Walls
Intellectual Property Law Group

925-432-7273



Recycled



University of California
Lawrence Livermore National Laboratory
Intellectual Property Law Group

Mail Station: L-703

Extension: 2-7273

Interoffice Memorandum

TO: Chris Fuller

L-223

FROM: Teresa Walls

wrong address!

SUBJECT: IL-10632

Dielectrophoretic Concentration of Particles Under Electrokinetic Flow

Enclosed is a copy of your above referenced patent application. The information in the patent application may be of a confidential nature and you are advised not to release any of the information contained therein without prior approval from this office, unless it is already available to the public. The Patent and Trademark Office does not allow public access to pending applications.

Also enclosed are two different forms for your signature and dating, "Combined Declaration and Power of Attorney" and "Assignment." After signing them, please forward the forms to Kerry A. Bettencourt for execution. Please return the forms to me at L-703 and I will file them with the Patent and Trademark Office.

Thank you for your courtesy.

Sincerely,

Teresa Walls
Intellectual Property Law Group

Enclosures:

CIL-10632 Patent Application
Combined Declaration and Power of Attorney
Assignment

Intellectual Property Law Group
(925) 423-9034

Robin R. Miles
80 Kendall lane
Danville, CA 94526

Re: IL-10632
"Dielectrophoretic Concentration of Particles Under Electrokinetic Flow"

Dear Robin Miles:

Enclosed is a copy of your above referenced patent application. The information in the patent application may be of a confidential nature and you are advised not to release any of the information contained therein without prior approval from this office, unless it is already available to the public. The Patent and Trademark Office does not allow public access to pending applications.

Also enclosed are two different forms for your signature and dating, "Combined Declaration and Power of Attorney" and "Assignment.". Please return the forms to me at L-703 and I will file them with the Patent and Trademark Office.

Very truly yours,



Teresa Walls
Intellectual Property Law Group

Enclosures

CLASSIFICATION REVIEW TRANSMITTAL

To: Mike Pocha
L-222

From: Teresa Walls
Intellectual Property Law Group
L-703

Subject: Patent Application:
(1) Authorized Derivative Classifier Determination
prior to
Classification and Export Control Review

For: IL-10632
"Dielectrophoretic Concentration of Particles Under Electrokinetic Flow"

Date
Transmitted:

COMMENTS:

This patent application is being sent to you for ADC review because you reviewed the Disclosure, Record of Invention before submission. Please return as soon as possible in order that we may file this application with the U.S. Patent and Trademark Office

Thank you.



University of California
Lawrence Livermore National Laboratory

Mail Station: L-703

Extension: 2-7273

Interoffice Memorandum

TO: Chris Fuller

FROM: Teresa Walls

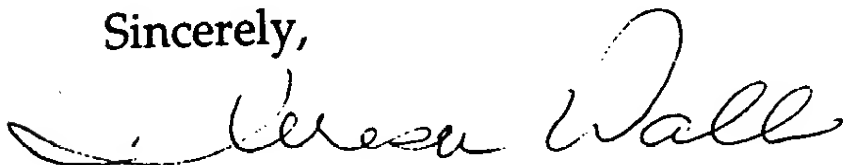
SUBJECT: IL-10632
Dielectrophoretic Concentration of Particles Under Electrokinetic Flow

Enclosed is a copy of your above referenced patent application. The information in the patent application may be of a confidential nature and you are advised not to release any of the information contained therein without prior approval from this office, unless it is already available to the public. The Patent and Trademark Office does not allow public access to pending applications.

Also enclosed are two different forms for your signature and dating, "Combined Declaration and Power of Attorney" and "Assignment. Please return the forms to me at L-703 and I will file them with the Patent and Trademark Office.

Thank you for your courtesy.

Sincerely,



Teresa Walls
Intellectual Property Law Group

Enclosures:

CIL-10632 Patent Application
Combined Declaration and Power of Attorney
Assignment



University of California
Lawrence Livermore National Laboratory
Intellectual Property Law Group

Mail Station: L-703

Extension: 2-7273

Interoffice Memorandum

TO: Kerry Bettencourt

L-223

FROM: Teresa Walls

SUBJECT: IL-10632

Dielectrophoretic Concentration of Particles Under Electrokinetic Flow

Enclosed is a copy of your above referenced patent application. The information in the patent application may be of a confidential nature and you are advised not to release any of the information contained therein without prior approval from this office, unless it is already available to the public. The Patent and Trademark Office does not allow public access to pending applications.

Also enclosed are two different forms for your signature and dating, "Combined Declaration and Power of Attorney" and "Assignment. Please return the forms to me at L-703 and I will file them with the Patent and Trademark Office.

Thank you for your courtesy.

Sincerely,

Teresa Walls
Intellectual Property Law Group

Enclosures:

CIL-10632 Patent Application
Combined Declaration and Power of Attorney
Assignment

CLASSIFICATION REVIEW TRANSMITTAL

To: Bill Fritchie
Classification Office
L-302

From: Teresa Walls
Patent Group
L-703

Subject: Patent Application:
Classification Review Requested Yes ☒ No ☐
Export Control Review Requested Yes ☒ No ☐
New Application

For: S-94,234
IL-10632

" Dielectrophoretic Concentration of Particles Under Electrokinetic Flow
Transmitted:

COMMENTS:

Bill,

Please review and return

Thank you.



University of California
Lawrence Livermore National Laboratory

Classification Review of Patent Application

| | |
|-------------------------|--|
| Docket Number: | IL-10632 |
| Unclassified Title: (U) | Dielectrophoretic Concentration of Particles Under Electrokinetic Flow |
| Inventors: | Robin R. Miles, Kerry A. Bettencourt, Christopher K. Fuller |

| | |
|--|---|
| Authorized Derivative Classifier Determination | |
| <input checked="" type="checkbox"/> Unclassified <input type="checkbox"/> Unclassified, but Controlled <input type="checkbox"/> UCNI Other: _____ <input type="checkbox"/> UCNI Reviewing Official Determination is required <input type="checkbox"/> Classified - Level and Category | |
| Specify Authority (Guide/Topics): _____ | |
| If NSI, Review/Declassify on (Date or Event): _____ | |
| Additional markings Required: | Weapon Data - Sigma(s): _____ Other: _____ |
| ADC Name: <i>M. D. POCHA</i> | ADC Title: <i>SECTION LEADER</i> |
| ADC Signature: <i>M. D. Pocha</i> | Date: _____ |

| | |
|---|-------------|
| UCNI Reviewing Official Determination (If requested) | |
| <input type="checkbox"/> The application does <i>not</i> contain UCNI. <input type="checkbox"/> The application <i>may</i> contain UCNI. <input type="checkbox"/> The application <i>does</i> contain UCNI. | |
| Reviewing Official Signature: _____ | Date: _____ |

| | |
|---|-------------|
| Classification Office Confirming Review | |
| <input type="checkbox"/> The ADC's determination is correct. <input type="checkbox"/> The Inventor's determination is correct. | |
| The correct classification is: _____ | |
| Reviewing Official Signature: _____ | Date: _____ |



University of California
Lawrence Livermore National Laboratory



Interdepartmental Letterhead

Mail Station L-312

EC-99-255

Ext: 4-3483

To: Terry Contreras, L-703

From: William R. Fritchie

Subject: Export Control Review for IL-10632 "Dielectrophoretic Concentration of Particles under Electrokinetic Flow"

Review of Regulations. An export control review of the subject technology was conducted using the following applicable regulations:

Nuclear Regulatory Commission (NRC). This technology is export controlled as Sensitive Technology under the NRC Regulations (10 CFR Part 110), dated : Yes___ No_X_
[web site: http://www.access.gpo.gov/nara/cfr/waisidx_99/10cfr110_99.html]

Department of Energy (DOE). This technology is export controlled as Sensitive Technology under the DOE Regulations (10 CFR Part 810), dated Yes___ No_X_
[web site: http://www.access.gpo.gov/nara/cfr/waisidx_99/10cfr810_99.html]

Department of State (DOS). This technology is export controlled under the DOS International Traffic in Arms Regulations (ITAR) (22 CFR Parts 120-130), dated Yes___ No_X_
[web site: http://www.access.gpo.gov/nara/cfr/waisidx_99/22cfrv1_99.html]

Department of Commerce (DOC). This technology is export controlled under the DOC Export Administration Regulations (EAR) (15 CFR Parts 730-774) dated Yes_X_ No___
[web site: http://www.access.gpo.gov/bxa/ear/ear_data.html]

Narrative. This technology is export controlled by the DOC EAR (15 CFR Part 774, Category 6, specifically ECCN EAR99), and requires no license for export, subject to the following caveat:

This technology may not be exported to individuals on the current Denied Persons List (15 CFR Part 764, Supplement 2) or to the presently embargoed countries of Cuba, Libya, North Korea, Iran, Iraq, Rwanda, Liberia, Somalia and Yugoslavia (15 CFR Part 746).

Separate license requirements may apply for the export of commodities associated with this technology. For additional licensing guidance, contact Lou Hill (Traffic/Shipping) at 424-4201.

William R. Fritchie
Classification Adviser

cc: Nancy Stone, L-703
Sara Sanders, L-795



Classification Review of Patent Application

| | |
|-------------------------|--|
| Docket Number: | IL-10632 |
| Unclassified Title: (U) | Dielectrophoretic Concentration of Particles Under Electrokinetic Flow |
| Inventors: | Robin R. Miles, Kerry A. Bettencourt, Christopher K. Fuller |

Authorized Derivative Classifier Determination

- ☒ **Unclassified**
☐ Unclassified, but Controlled
☐ UCNI Other: _____
☐ UCNI Reviewing Official Determination is required
☐ **Classified** - Level and Category

Specify Authority (Guide/Topics): _____

If NSI, Review/Declassify on (Date or Event): _____

Additional markings Required: _____

Weapon Data - Sigma(s): _____

Other: _____

ADC Name: *M. D. POCHA*

ADC Title: *SECTION LEADER*

ADC Signature: *M. D. Pocha*

Date: _____

UCNI Reviewing Official Determination (If requested)

- ☐ The application does *not* contain UCNI.
☐ The application *may* contain UCNI.
☐ The application *does* contain UCNI.

Reviewing Official Signature: _____

Date _____

Classification Office Confirming Review

- ☒ The ADC's determination is correct.
☐ The Inventor's determination is correct.

The correct classification is: _____

Reviewing Official Signature: _____

Date _____

William R. Fritchie
 Classification/Export Control Adviser



University of California
 Lawrence Livermore National Laboratory

CLASSIFICATION REVIEW TRANSMITTAL

To: Bill Fritchie
Classification Office
L-302

From: Teresa Walls
Patent Group
L-703

Subject: Patent Application:
Classification Review Requested
Export Control Review Requested
New Application

Yes ☒ No ☐

Yes ☒ No ☐

EC Review
in Hand

For: S-94,234
IL-10632

" Dielectrophoretic Concentration of Particles Under Electrokinetic Flow
Transmitted:

COMMENTS:

Bill,

Please review and return

Thank you.



University of California
Lawrence Livermore National Laboratory



University of California
Lawrence Livermore National Laboratory
Office of Patent Counsel

— —
Mail Station: L-703

Extension: 2-7273

Interoffice Memorandum

TO: Janet Rego L-376
Nina Rhodes L-795

FROM: Teresa Walls

SUBJECT: IL-10632
Dielectrophoretic Concentration of Particles Under Electrokinetic
Flow

Enclosed, for your records, is a copy of the Patent Application, Assignment, Recordation Cover Sheet, and Return Postcard.

If you have any questions, please do not hesitate to call.

Teresa Walls
LLNL Patent Group

Enclosure
As Noted



University of California
Lawrence Livermore National Laboratory
Office of Patent Counsel

Mail Station: L-703

Extension: 2-7273

Interoffice Memorandum

TO: Nancy Stone

FROM: Teresa Walls

SUBJECT: USE OF PATENT GROUP DEPOSIT ACCOUNT (12-0695)

As of this date, I have charged the following amount(s) to the Patent Group deposit account:

| <u>Amount</u> | <u>IL Number</u> | <u>Attorney</u> | <u>Type of Action</u> |
|-----------------|------------------|-----------------|--|
| \$40.00 | IL-10632 | AT | Fee for Filing New Application |
| <u>\$355.00</u> | | | New Application Transmittal (Small Entity) |
| \$395.00 Total | | | |





Department of Energy
Oakland Operations Office
Office of Chief Counsel
Intellectual Property Law Division

Livermore Office
P.O. Box 808, L-376
Livermore, CA 94550
(925) 422-4367
FAX (925) 422-8228

RECEIVED

Janet G. Tulk, LLNL Laboratory Counsel, L-703

REGARDING: DOE Case No.: S-94,234
U.S. Patent Application S.N: 09/733,857
Filing Date:
Invention Title: Dielectrophoretic Concentration of Particles Under
Electrokinetic Flow
Contractor's Docket No.: IL-10632
Reported Under Contract No.: W-7405-ENG-48
Inventor(s): Robin R. Miles et al.
DOE Waiver No.: W(C) 92-002-721

LLNL - I. P. L. G.

SUBJECT: Confirmatory License

Dear Ms Tulk:

The request for waiver of Government rights in the above-identified invention was approved, effective

In accordance with Contract Number W-7405-ENG-48, a Confirmatory License acknowledging the U.S. Government's license in the subject invention is enclosed for execution on behalf of the University and return to this office. Your prompt attention to this matter is appreciated.

Sincerely,

William C. Daubenspeck
Patent Attorney

Enclosures: Confirmatory License (2)

cc: Sara Sanders, LLNL, L-795

WCD:JLR:wkc

CONFIRMATORY LICENSE

Title: Dielectrophoretic Concentration of Particles
Under Electrokinetic Flow
Inventor(s): Robin R. Miles et al.
Contract Number: W-7405-ENG-48
Contractor: Regents of the University of
California

DOE Docket No.: S-94,234
Docket No.: IL-10632
U.S. Patent Application S.N.: 09/733,857
Filing Date:
Waiver No.: W(C) 92-002-721

Foreign patent applications filed or intended to be filed at contractor's expense in (countries):

The Contractor certifies that a true copy of the provisions which govern patent rights in "subject inventions" under the above-identified contract is herewith submitted or has been submitted to the U.S. Department of Energy by certification dated

WHEREAS, the above-identified invention is a subject invention under the above-identified contract;

WHEREAS, the Class Waiver W(C) 92-002-721 of Government rights in certain identified inventions and the above-identified contract provides the Contractor with the right to elect to retain title in certain subject inventions and the Contractor has elected to retain title in the above-identified subject invention, EXCEPT FOR a paid-up license under the above-identified contract and the above-identified waiver, effective August 23, 2000.

ACCORDINGLY, the Contractor hereby confirms that under the provisions of the above-identified contract governing patent rights, it has granted to the Government a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world. This license applies to the above-identified invention, the above-identified patent application(s), and any and all divisions or continuations thereof and any resulting patent or reissue patent which may be granted thereon.

The Government reserves for itself, and is hereby granted by the Contractor, the irrevocable power to inspect and make copies of the file wrapper(s) of the above-identified U.S. patent application and of any related or continuation patent application(s), whether domestic or foreign, for the above-identified invention.

It is understood and agreed that this instrument does not preclude the Government from asserting rights under the provisions of the above-identified contract or any other agreement between the Government and the Contractor, or any other rights of the Government with respect to the above-identified invention.

Signed on behalf of: THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

(Contractor)

Witness:

Nancy J. Stone
(Signature)

By:

Janet G. Tulk
(Contractor Official's Signature)

(Date)

Nancy J. Stone, Administrative Assistant
(Name and Title)

Janet G. Tulk, Laboratory Counsel
(Print/Type Contractor Official's Name and Title)

Lawrence Livermore National Laboratory
(Print/Type Contractor's Address)

P. O. Box 808, L-701

Livermore, CA 94551-0808